SERVICE MANUAL

TWO-SPEED AUTOMATIC TURNTABLE

SANSUI FR-4060

Sansui

SANSUI ELECTRIC CO., LTD.

This service manual is designed for service engineers to repair, adjust, maintain and order the replacement parts of the FR-4060 correctly. When ordering the parts, use the stock number and parts name specifically referring to the parts list.

For general usage and maintenance of the unit, please refer to the operating instructions attached with unit.

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1. SPECIFICATIONS

TYPE ..... two-speed belt-driven automatic turntable

AUTOMATIC OPERATION ..... automatic lead-in, return, cut and repeat by 3 r.p.m. synchronous motor

PLATTER ..... aluminum alloy die-cast, diameter 300 mmφ (12″), weight 1.7 kg (3.8 lbs.)

MOTOR ..... 4-pole synchronous

SPEED ..... 33⅓ r.p.m. and 45 r.p.m.

WOW and FLUTTER ..... less than 0.06% (W.R.M.S.)

S/N RATIO ..... better than 50dB

TONEARM ..... statically balanced S-shaped tubular tonearm with lateral balancer, inside force canceler, direct read-out stylus pressure dial, 4-contact plug-in head shell

- TONEARM LENGTH ..... 220mm (8⅝″)
- OVERHANG ..... 15mm (9/16″)
- STYLUS PRESSURE ALLOWANCE .. 0~3g
- USABLE CARTRIDGE WEIGHT .... 4~20g(using head shell and subweight supplied)

CARTRIDGE ..... moving magnet type (SV-27)

- FREQUENCY RESPONSE ..... 10~23,000Hz
- OUTPUT VOLTAGE ..... 3.5mV at 1,000Hz 50mm/sec.
- LOAD IMPEDANCE 50kΩ
- STYLUS ..... 0.5 mil, diamond spherical (SN-27)
- OPTIMUM STYLUS PRESSURE .... 1.5g~2.0g

POWER REQUIREMENTS ..... 120V or 240V, 50Hz or 60Hz

POWER CONSUMPTION 13W

DIMENSIONS ..... 469mm (18½″)W, 204mm(8″)H, 381mm(15″)D

WEIGHT ..... 10.6 kg (23.4 lbs.)

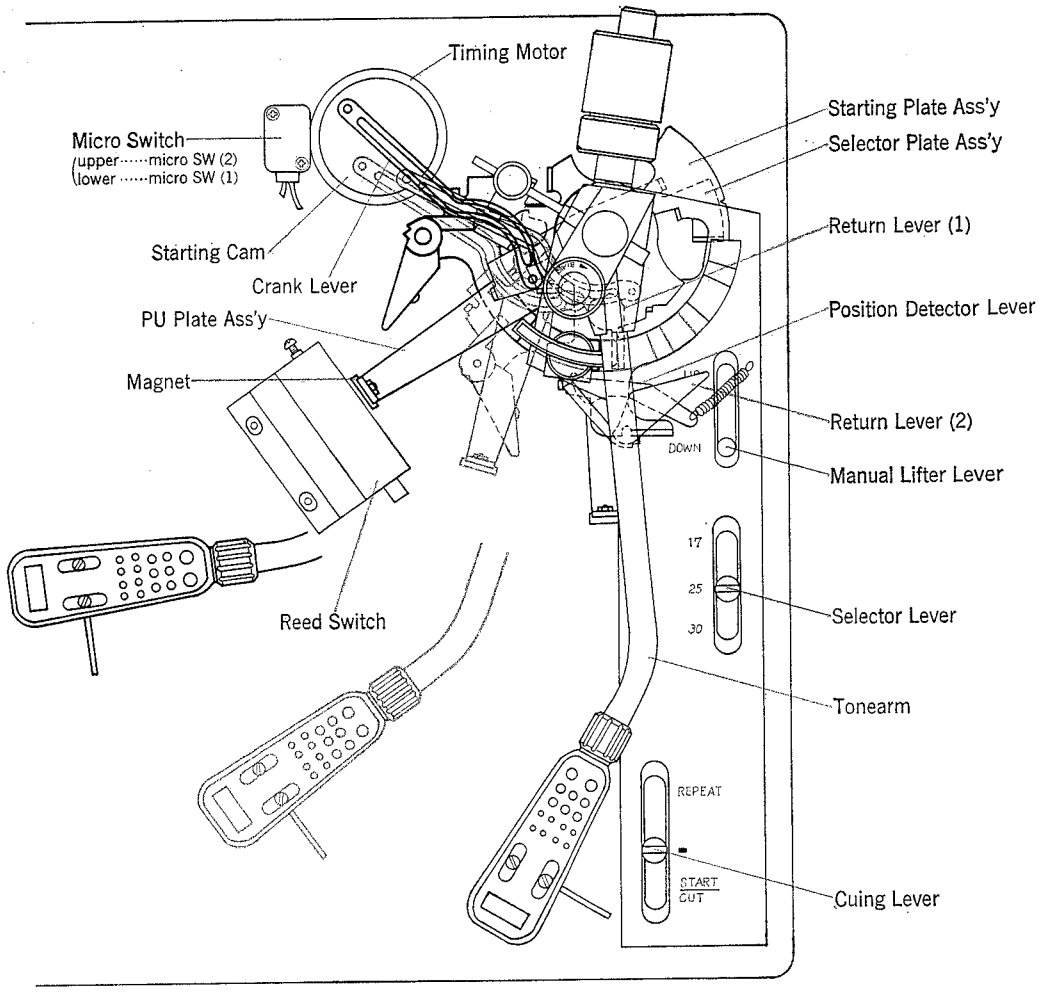
* Design and specifications subject to change without notice for improvements.

2. OPERATION OF MECHANISM

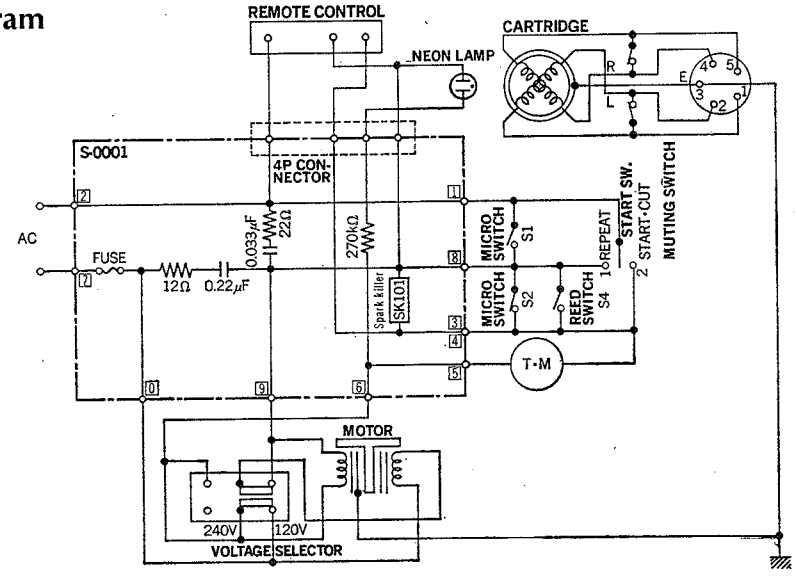
2-1. Operation of Auto Mechanism (See Fig. 2-1)

1. At the condition of STOP, the micro switch (SW1) and start switch (leaf switch) are OFF, on the other hand, the micro switch (SW2) and muting switch are ON. (cartridge at shortcircuiting condition).
2. When the cuing lever is placed at START position, start switch becomes ON and timing motor starts running.
   The timing motor is coupled with starting cam and the starting cam controls the micro switch. When the timing motor starts running, the starting cam starts moving together and the micro switch (SW1) becomes ON from OFF. (Therefore, as for the start switch, the switch is turned ON temporarily).
   Simultaneously with it, the main motor will start operating.
3. When the starting cam makes in half revolution, the starting plate will turn up to a certain angle. Meanwhile, if the cam does in another half revolution, the plate will reversely revolves in its function. Namely, when the starting cam carrys out in one revolution, the starting plate makes one cycle movement.
4. As tne starting plate and starting cam are coupled with crank lever, the starting plate will be operated while the timing motor is being operated. When the timing motor, starting cam and starting plate are operated, the return lever (1) will push PU plate ass'y located at the lower part of the tonearm and it will keep pushing the tonearm until it reaches to the position of the lead-in groove of disk.
   When it comes to this position, the selector plate ass'y. connected with tip end of selector plate will serve as stopper and the return lever (1) which pushes PU plate ass'y so far will be tunned over and it does not push the PU plate ass'y anymore. Then, it is at AUTO-IN position.
   In addition, before the return lever (1) starts pushing the tonearm, the return lever (2) is turned over reversely by the position detector lever in order that AUTO-IN funtion will be normally operative.
5. When the tonearm comes to the AUTO-IN position, the starting cam will be made in half revolution. The micro switch (SW2) which is so far ON will be turned OFF, and the timing motor will stop. Simultaneously with it, the muting switch is turned OFF (cartridge at open condition) from ON (cartridge at shortcircuiting condition),and performance starts as a result.
6. In performance, the micro switch (SW1) is ON, the micro Switch(SW2) and muting switch are OFF. When performance proceeds and the tonearm traces up to the lead-out groove, the magnet located at tip end of PU plate ass'y comes at side of reed switch and turns this reed switch ON. When the reed swich is turned ON, the timing motor will start running and the micro switch (SW2) will be turned ON.
7. When the timing motor starts operation once again, the starting cam will start next half revolution.
   Then, the starting plate revolves contrary to that at the time of AUTO-IN and the return lever (2) pushes the PU plate ass'y from the reverse direction and makes tonearm return. The tonearm returned by the return lever(2) comes to the position of arm rest, and it will be stopped by the arm rest, then the tonearm will land on the rest.
   In the process of this return operation, the return lever(2) turned over by the position detector lever will return to the original condition again.
8. When the cuing lever is placed at position of REPEAT, the timing motor starts running again because the start switch is ON even if performance finished and the micro switch (SW1) becomes OFF. Accordingly, as the micro switch (SW1) which was OFF is turned ON, REPEAT performance will be made.

Fig. 2-1



◇ Schematic diagram



2-2. Operation of Manual Mechanism

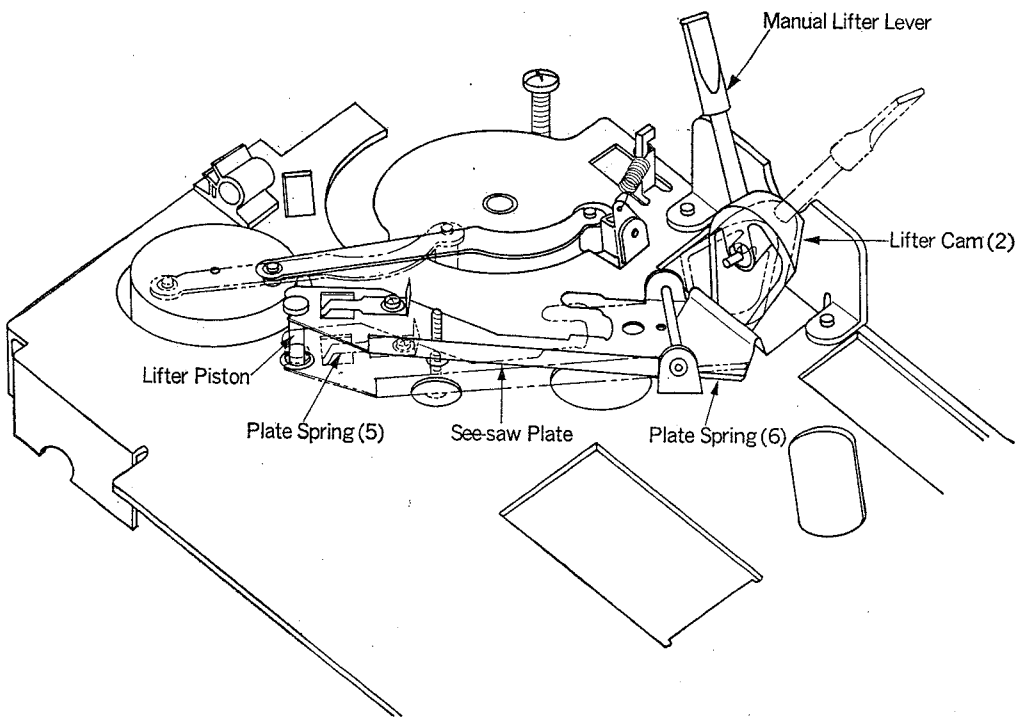
1. Manual Operation

1) Operate the turntable by setting the cuing lever to the START/CUT position.
2) Set the Manual lifter lever to the UP position, and moreover set the tonearm to a suitable position.
3) Then set the Manual lifter lever to the DOWN position. The machine begins performance when the stylus reaches on the surface of disk.
4) The tonearm returns automatically by the function of the reed switch when the stylus proceeds as far the finishing groove after the end of performance. Therefore, the MANUAL operation is made from the lead-in groove to the lead-out groove. If you want to stop in the middle of performance, set the Manual lifter lever to the UP position, and the stylus will lift up from the surface of disk.

2-3. Manual Movement (See Fig. 2-2)

1) The plate spring (6) connected with the see-saw plate which is so far pushed down by the lifter cam (2) will move up when the tonearm is put on suitable position of disk and also the Manual lifter lever is set to the DOWN position.
2) When the plate spring (6) with the see-saw plate moves up, the plate spring (5) will move down because the whole plate spring has a function of see-saw mechanism. Accordingly, performance will be automatically made as the tonearm (stylus) connected with the plate spring (5) will come down to the disk.
3) If the Manual lifter lever is set to the UP position, no matter where the tonearm is on, the stylus will lift up from the surface of the disk.
4) When performing Manual operation on any surface of disk, and afterwards setting to Auto-IN position, the Auto operation including Auto-IN and Auto-RETURN is not operative because the return lever (1) connected at the end of tonearm is not turned reversely by the size set plate ass'y. Auto operation will be normally made, as the return lever (1) will be turned reversely by moving the tonearm to the position on lead-out groove of disk or placing it on the arm rest.

Fig. 2-2

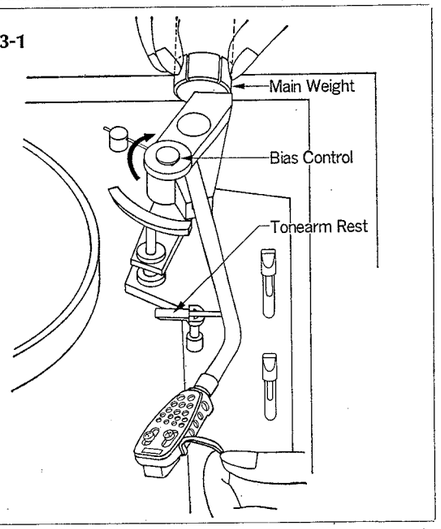


3. ADJUSTMENTS

3-1. Adjustment of Stylus Pressure (See Fig. 3-1, 3-2 and 3-3)

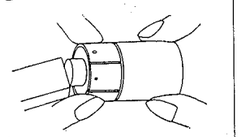
1) Turn the Bias Control clockwise until it stops. The built-in Inside Force Canceler will then become inoperative.
2) Take the stylus cover off the cartridge, free the tonearm from the tonearm rest, and move the tonearm over to the right of the tonearm rest.
3) Turn and move the main weight forward or back to balance the tonearm horizontally first.

Fig. 3-1



4) With the tonearm balanced horizontally, turn only the stylus pressure dial until its zero mark falls into line with the weight shaft line, without moving the main weight itself.

Fig. 3-2



5) Now turn the main weight counterclockwise (as seen from the front of the turntable) until the required stylus pressure indication comes into line with the weight shaft line. If you are using the cartridge supplied, set the weight on the suitable point between 1.5 and 2.

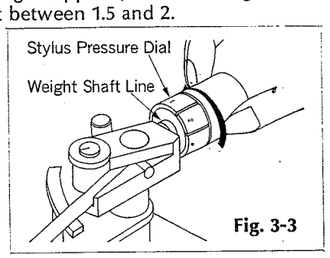
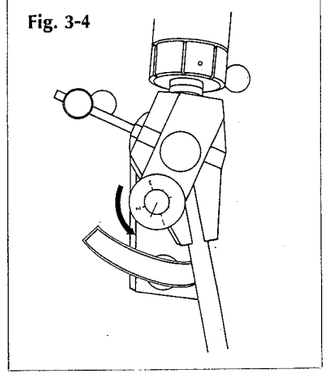


Fig. 3-3

3-2. Adjustment of Bias (See Fig. 3-4)

Adjust this control to the same weight marking as the stylus pressure you have selected.

Fig. 3-4



3-3. Adjustment of Auto-In, Auto-Return (25cm and 30cm disk) (See Fig. 3-5, 3-6 and 3-7)

1) The adjusting screw "A" in Fig. 3-7 is one to adjust the position of AUTO-IN(of setting down the tonearm on the surface of the disk)
   The adjustin gscrew "B" in Fig. 3-7 is the one to adjust the position of AUTO-RETURN (of lifting off the tone arm from the disk).
2) When the screw "A" is turned clockwise, the timing of AUTO-IN will become sooner. To the contrary, when it is turned counterclockwise, the timing of AUTO-IN will become later.
   Make adjustment of the screw in such a way that the tip of the stylus will touch the middle way of the lead-in groove.
3) When the screw "B" is turned clockwise, the action of AUTO-RETURN will become later. To the contrary, when it is turned counterclockwise, the action of AUTO-RETURN will become sooner.
   Make adjustment of the screw in such a way that AUTO-RETURN operation is carried out at the middle way of the lead-out groove.

Fig. 3-5

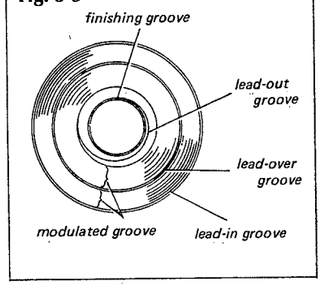
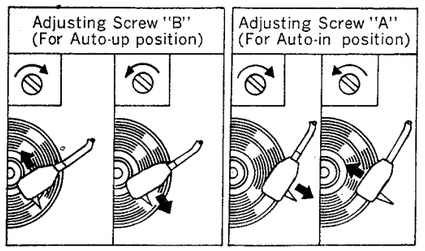


Fig. 3-6



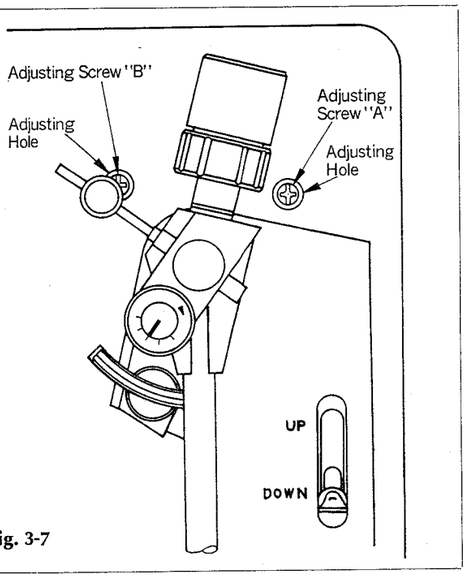
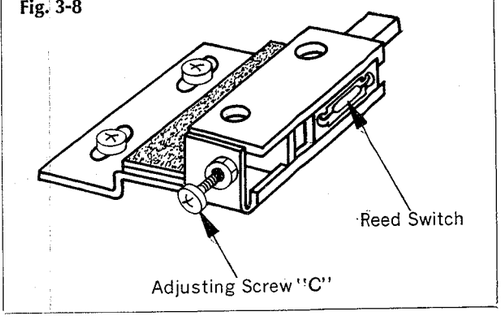


Fig. 3-7

3-4. Adjustment of Auto-Return (17cm disk) (See Fig. 3-8)

1) The adjusting screw "C" as hown in Fig. 3-8 is the one to adjust the position of AUTO-RETURN of 17cm disk.
   In case that the function of AUTO-RETURN of 25cm and 30cm disks is normally operative, but the 17cm is not, turn the screw "C" in Fig. 3-8, and adjust it.
   When the timing of AUTO-RETURN is later, turn it clockwise. To the contrary, if it is sooner, turn it counterclockwise, and make adjustment of the screw in such a way that AUTO-RETURN operation is carried out on the central position of lead-out groove.
2) Carry out the locking paint to the abovementioned screws after adjustment.

Fig. 3-8

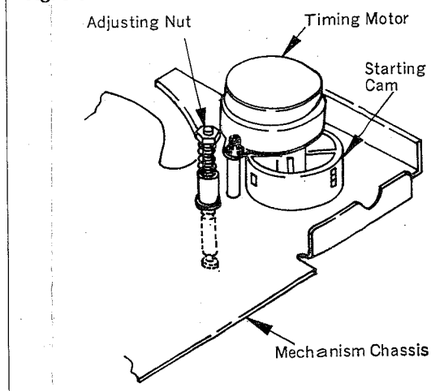


3-5. Adjustment of Manual Mechanism (See Fig. 3-9)

Please make the adjustment for lift-down speed of the manual lifter as below.

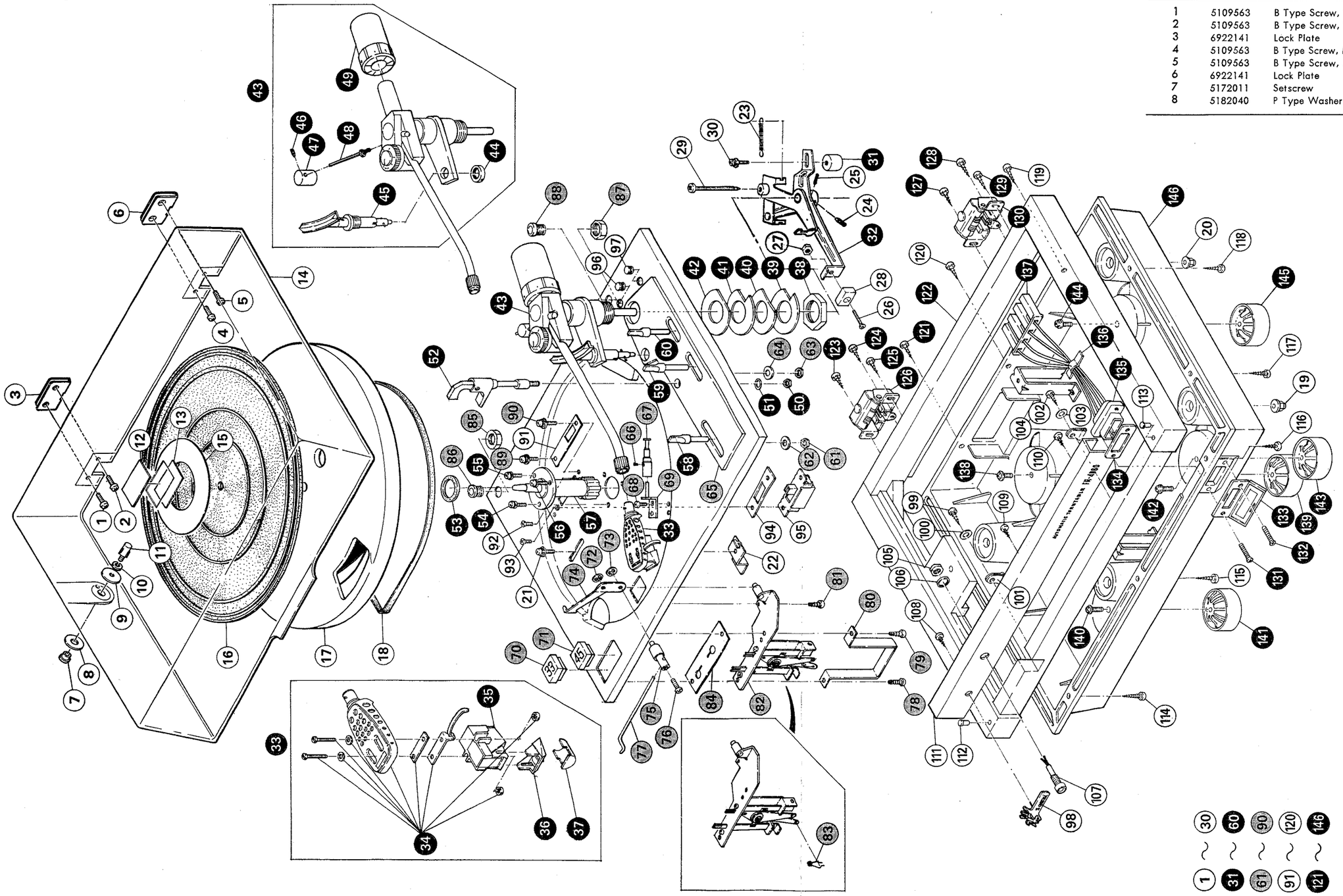
1) The adjusting nut as shown in Fig. 3-9 is for changing lift down speed in MANUAL mechanism.
2) When the nut is turned clockwise, the lift down speed will be faster.
3) To the contrary, when it is turned counterclockwise, the lift down speed will be later.
4) The speed in MANUAL operation should be adjusted as same as the speed in AUTO operation. (There is no any nut to adjust the speed in AUTO mechanism.)
5) Carry out the locking paint to the abovementioned nut after adjustment.

Fig. 3-9



4. EXPRODED VIEWS AND PARTS LIST

4-1. Top View



4-1. Top View Parts List

Parts No.	Stock No.	Description
1	5109563	B Type Screw, M4×10
2	5109563	B Type Screw, M4×10
3	6922141	Lock Plate
4	5109563	B Type Screw, M4×10
5	5109563	B Type Screw, M4×10
6	6922141	Lock Plate
7	5172011	Setscrew
8	5182040	P Type Washer, 5×20×1

1. Pan Head Screw ..... P
2. Pan Head SEMS Screw ..... PSA
3. Pan Head SEMS Screw ..... PSB
4. Pan Head SEMS Screw ..... PSF
5. Binding Head Screw ..... B
6. Flat Countersunk Head Screw ..... F
7. Flat Countersunk Wood Screw ..... FC
8. Round Head Wood Screw ..... RH
9. Hex. Socket Set-screw (Flat Point) ..... SF
10. Slot Type Setscrew ..... SS
11. Spring Washer ... S
12. Plain Washer ..... P
13. Retaining Ring (E Washer) ..... E

Parts No.	Stock No.	Description
9	5182030	P Type Washer, 3×20×1
10	5121240	S Type Washer, 3ϕ
11	5212011	Adaptor Stay
12	5362013	Name Plate, dust cover
13	5362013	Name Plate, dust cover
14	5062103	Dust Cover F
15	5392080	Ring, turntable
16	5502220	Rubber Mat, turntable
17	6112101	Turntable (Platter)
18	6032120	Belt
19	5172140	Self Locking Nut, M4
20	5172140	Self Locking Nut, M4
21	5107762	PSB Type Screw, M4×8
22	5222111	Lock Plate
23	6902192	Spring (2), position detector
24	5162330	SC Type Screw, M3×5
25	5162330	SC Type Screw, M3×5
26	5102706	F Type Screw, M2×10
27	5172190	Hex. Nut, M2
28	4930040	Magnet
29	5162241	Adjusting Screw (1)
30	5107744	PSB Type Screw, M3×8
31	6912122	Arm Balancer
32	7052330	PU Plate Ass'y
33		Cartridge Ass'y
34	6642070	Head Shell Ass'y
35	4310100	Cartridge (SV-27)
36	4940090	Stylus (SN-27)
37	5372030	Stylus Cover
38		Hex. Nut, M17
39	5292160	Panel Weight
40	5502350	Dumper Rubber
41	5292160	Panel Weight
42	5502350	Dumper Rubber
43	7092180	Tonearm Ass'y
44		Stopper Nut, lifter
45	7082110	Tonearm Lifter Ass'y
46	5106141	SS Type Screw, M3×4
47	6912290	Weight, lateral
48		Lateral Bar Ass'y
49	6912280	Weight, main
50	5110241	Hex. Nut, M3
51	5121240	S Type Washer, 3ϕ
52	6622144	Arm Rest Ass'y
53	5182300	Oil Retainer
54	5162370	PSA Type Screw, M4×10
55	5162370	PSA Type Screw, M4×10
56	5162370	PSA Type Screw, M4×10
57	7032081	Spindle Ass'y, turntable
58	5312124	Cuing Lever
59	5312142	Selector Lever
60	5312133	Manual Lifter Lever
61	5110261	Hex. Nut, M4
62	5182141	P Type Washer, 4.4ϕ
63	5110261	Hex. Nut, M4
64	5182141	P Type Washer, 4.4ϕ
65	6362253	Control Base
66	5162330	SC Type Screw, M3×5
67	6142213	Capstan (50Hz)
68	5103642	PT Type Screw, M3×8
69	5262132	Holder, capstan
70	5322062	Push Button (1)
71	5322072	Push Button (2)
72	5151004	E Type Washer, 3ϕ
73	5151004	E Type Washer, 3ϕ
74	7062151	Belt Guide
75	6212012	Adjusting Shaft
76	5103043	P Type Screw, M3×6
77	6532010	Linkage Rod

Parts No.	Stock No.	Description
78	5103642	PT Type Screw, M3×8
79	5103642	PT Type Screw, M3×8
80	5212102	Stay, speed selector base
81	5103642	PT Type Screw, M3×8
82	7062081	Speed Selector Ass'y
83	6902171	Spring, speed selector base
84	5262213	Guide Plate
85	5172020	Hex. Nut, M14
86	5252082	Holder, shell
87	5172020	Hex. Nut, M14
88	5252070	Holder, sub weight
89	5162450	PSB Type Screw, M3×6
90	5162450	PSB Type Screw, M3×6
91	5262141	Lock Plate, voltage selector
92	5102143	F Type Screw, M3×6
93	5102143	F Type Screw, M3×6
94	5232280	Spacer, slide switch
95	1110100	Slide Switch, voltage selector
96	5062131	Rubber Bushing
97	5062131	Rubber Bushing
98	5332022	Badge
99	5140025	RH Type Screw, M3.1×10
100	5120341	P Type Washer, 3ϕ
101	3910160	Nylon Clip (HP-2N)
102	5140025	RH Type Screw, M3.1×10
103	5120341	P Type Washer, 3ϕ
104	3910160	Nylon Clip (HP-2N)
105		Hex. Nut, neon lamp
106		P Type Washer, neon lamp
107	0410070	Neon Lamp
108	5143010	FC Type Screw, M2.4×13
109	5143010	FC Type Screw, M2.4×13
110	5143010	FC Type Screw, M2.4×13
111	5302062	Front Panel
112	5502021	Rubber Cushion
113	5502021	Rubber Cushion
114	5140027	RH Type Screw, M3.1×16
115	5140027	RH Type Screw, M3.1×16
116	5140027	RH Type Screw, M3.1×16
117	5140027	RH Type Screw, M3.1×16
118	5140027	RH Type Screw, M3.1×16
119	5140027	RH Type Screw, M3.1×16
120	5140027	RH Type Screw, M3.1×16
121	5140027	RH Type Screw, M3.1×16
122	5732251	Cabinet
123	5140027	RH Type Screw, M3.1×16
124	5140027	RH Type Screw, M3.1×16
125	5140027	RH Type Screw, M3.1×16
126	6922160	Auto Hinge
127	5140027	RH Type Screw, M3.1×16
128	5140027	RH Type Screw, M3.1×16
129	5140027	RH Type Screw, M3.1×16
130	6922160	Auto Hinge
131	5102650	F Type Screw, M3×20
132	5102650	F Type Screw, M3×20
133	5302051	Cap, remote control socket
134	5232180	Spacer, remote control socket
135	2410550	Remote Control Socket
136	3910430	Press Clip
137	2420190	4P Connector
138	5101562	BSF Type Screw, M4×8
139	5592011	Insulator
140	5101562	BSF Type Screw, M4×8
141	5592011	Insulator
142	5101562	BSF Type Screw, M4×8
143	5592011	Insulator
144	5101562	BSF Type Screw, M4×8
145	5592011	Insulator
146	5732165	Bottom Cover

4-2. Bottom View Parts List

Parts No.	Stock No.	Description
1	5103541	PT Type Screw, M3×6
2	5103541	PT Type Screw, M3×6
3	5162320	Holder, cushion spring
4	5120161	P Type Washer, 4φ
5	6902691	Cushion Spring (Yellow)
6	5102142	F Type Screw, M3×5
7	5242210	Bracket, cushion spring
8	5107762	PSB Type Screw, M4×8
9	5107762	PSB Type Screw, M4×8
10	5107762	PSB Type Screw, M4×8
11	5107762	PSB Type Screw, M4×8
12	5107762	PSB Type Screw, M4×8
13	5103022	P Type Screw, M2.6×4
14	5103022	P Type Screw, M2.6×4
15	1190160	Start Switch
16	5107743	PSB Type Screw, M3×6
17	6902544	Plate Spring (3)
18	5110261	Hex. Nut, M4
19	5121360	S Type Washer, 4φ
20	6202271	Shaft, cuing cam
21	7052297	Cuing Cam
22	6202102	Stopper Screw
23	6502434	Adjusting Cam
24	5107746	PSB Type Screw, M3×12
25	6202132	Collar, spring holder
26	6902575	Torsion Spring
27	5182201	P Type Washer, 5×1.0
28	5151001	E Type Washer, 1.5φ
29	5502243	Bushing
30	5151001	E Type Washer, 1.5φ
31	5151001	E Type Washer, 1.5φ
32	5110261	Hex. Nut, M4
33	5121360	S Type Washer, 4φ
34	6202281	Shaft, selector cam
35	7052304	Selector Cam
36	6532085	Linkage Rod, selector
37	6902192	Spring (2), selector plate
38	5162330	SC Type Screw, M3×5
39	5162330	SC Type Screw, M3×5
40	5112030	Stopper Nut
41	5182190	P Type Washer, 12×0.25
42	5107743	PSB Type Screw, M3×6
43	6902243	Plate Spring (1)
44	5107743	PSB Type Screw, M3×6
45	5107743	PSB Type Screw, M3×6
46	5292133	Plate, size set
47	5162330	SC Type Screw, M3×5
48	5151006	E Type Washer, 5φ
49	5182211	P Type Washer, 6×1.0
50	5182170	P Type Washer, 6×0.25
51	6212023	Rotation Pin
52	5162251	Adjusting Screw (2)
53		Selector Plate Ass'y
54	5182190	P Type Washer, 12×0.25
55	6902213	Spring (1), detector lever
56	5151003	E Type Washer, 2.3φ
57	6502413	Lever, position detector
58	6902642	Spring (3), return bracket
59	5151003	E Type Washer, 2.3φ
60	5182160	P Type Washer, 3×0.13
61	6512081	Return Bracket (2)
62	5182160	P Type Washer, 3×0.13
63	5151003	E Type Washer, 2.3φ
64	6502428	Return Lever (2)
65	5151003	E Type Washer, 2.3φ
66	6502225	Return Lever (1)
67	5162390	PSA Type Screw, M3×6
68	6902722	Plate Spring (2-B)
69	5162390	PSA Type Screw, M3×6
70	6902662	Plate Spring (2-A)
71	5151003	E Type Washer, 2.3φ
72	5182160	P Type Washer, 3×0.13
73	5182160	P Type Washer, 3×0.13
74	6512055	Starting Plate
75	5182190	P Type Washer, 12×0.25
76	5151003	E Type Washer, 2.3φ
77	5182160	P Type Washer, 3×0.13
78	6512070	Crank Lever
79	5182160	P Type Washer, 3×0.13
80	5107743	PSB Type Screw, M3×6
81	5107743	PSB Type Screw, M3×6
82	5107743	PSB Type Screw, M3×6
83	5107743	PSB Type Screw, M3×6
84	5226012	Holder, P.C.B.
85	7732070	Power Circuit Board Ass'y
86	5166460	Washer Head Tapping Screw, M3×8
87	2110010	1L1A Lug Terminal
88	5103051	P Type Screw, M3×25
89	5121240	S Type Washer, 3φ
90	5103051	P Type Screw, M3×25
91	5121240	S Type Washer, 3φ
92	1160160	Micro Switch
93	5622016	Shield Plate
94	1160160	Micro Switch
95	5622016	Shield Plate
96	5107743	PSB Type Screw, M3×6
97	5107743	PSB Type Screw, M3×6
98	6902204	Spring, reed switch
99	5103050	P Type Screw, M3×20
100	5110241	Hex. Nut, M3
101	5103043	P Type Screw, M3×6
102	5103043	P Type Screw, M3×6
103	5622050	Protector Sheet
104	6632042	Holder, reed switch
105	7062170	Reed Switch Ass'y
106	5222031	Bracket, reed switch
107	5107744	PSB Type Screw, M3×8
108	1190150	Muting Switch
109	5162330	SC Type Screw, M3×5
110	5107744	PSB Type Screw, M3×8
111	5107744	PSB Type Screw, M3×8
112	4320220	Timing Motor
113	6012187	Starting Cam
114	6902642	Spring (3), return bracket
115	5151003	E Type Washer, 2.3φ
116	5182160	P Type Washer, 3×0.13
117	6512092	Return Bracket (1)
118	5182160	P Type Washer, 3×0.13
119	5110261	Hex. Nut, M4
120	5120161	P Type Washer, 4φ
121	6902283	Spring, lifter
122	6532032	Lifter Piston
123	3910120	Wire Clip
124	3910120	Wire Clip
125	3910120	Wire Clip
126	5107743	PSB Type Screw, M3×6
127	5107743	PSB Type Screw, M3×6
128	5151003	E Type Washer, 2.3φ
129	6502513	Lifter Cam (2)
130	5120080	P Type Washer, 5φ
131	5262200	Bracket, Lifter cam
132	5151003	E Type Washer, 2.3φ
133	6202292	Shaft, seesaw plate
134	5151003	E Type Washer, 2.3φ
135	5103022	P Type Screw, M2.6×4
136	5120120	P Type Washer, 2.6φ
137	6902603	Plate Spring (5), seesaw plate
138		Seesaw Plate Ass'y

Parts No.	Stock No.	Description
139	5162320	Holder, cushion spring
140	5120161	P Type Washer 4ϕ
141	6902701	Cushion Spring (Blue)
142	5107743	PSB Type Screw, M3×6
143	2110070	2L2VB Lug Terminal
144	5107743	PSB Type Screw, M3×6
145	5262191	Holder, lead wire
146	5107762	PSB Type Screw, M4×8
147	6902691	Cushion Spring (Yellow)
148	5166460	Washer Head Tapping Screw, M3×8
149	2120010	Lug Terminal
150	5166460	Washer Head Tapping Screw, M3×8
151	3910160	Nylon Clip (HP-2N)
152	5166460	Washer Head Tapping Screw, M3×8
153	3910170	Nylon Clip (HP-3N)
154	5166460	Washer Head Tapping Screw, M3×8
155	3910170	Nylon Clip (HP-3N)
156	5107762	PSB Type Screw, M4×8
157	6902681	Cushion Spring (Red)
158	5166460	Washer Head Tapping Screw, M3×8
159	5166460	Washer Head Tapping Screw, M3×8
160	5103043	P Type Screw, M3×6
161	5103043	P Type Screw, M3×6
162	2090020	DIN Connector
163	3910020	Cord Stopper
164	3800020	Power Cord
165	5242203	Rear Panel

Parts No.	Stock No.	Description
166	5110261	Hex. Nut, M4
167	5120080	P Type Washer, 5ϕ
168	5151005	E Type Washer, 4ϕ
169	5120080	P Type Washer, 5ϕ
170	5151005	E Type Washer, 4ϕ
171	5120080	P Type Washer, 5ϕ
172	5502311	Rubber Cushion (Black)
173	5502321	Rubber Cushion (White)
174	5162330	SC Type Screw, M3×5
175	6142223	Capstan (60Hz)
176	5110261	Hex. Nut, M4
177	5121360	S Type Washer, 4ϕ
178	5232231	Spacer, motor
179	5110261	Hex. Nut, M4
180	5121360	S Type Washer, 4ϕ
181	5232231	Spacer, motor
182	5110261	Hex. Nut, M4
183	5121360	S Type Washer, 4ϕ

Parts No.	Stock No.	Description
184	5232231	Spacer, motor
185	5110261	Hex. Nut, M4
186	5121360	S Type Washer, 4ϕ
187	5232231	Spacer, motor
188	4320230	Motor
189	5202071	Motor Sheet
190	5156460	Washer Head Tapping Screw, M3×8
191	5166460	Washer Head Tapping Screw, M3×8

Parts No.	Stock No.	Description
192	5103043	P Type Screw, M3×6
193	5103043	P Type Schew, M3×6
194	2210210	2P Output Terminal
195	3910020	Cord Stopper
196	3800020	Power Cord
197	5242330	Rear Panel
198	3810170	PU Output Cord
199	3810190	Output Cord

4-2. Bottom View

Fig. 4-1

A Type

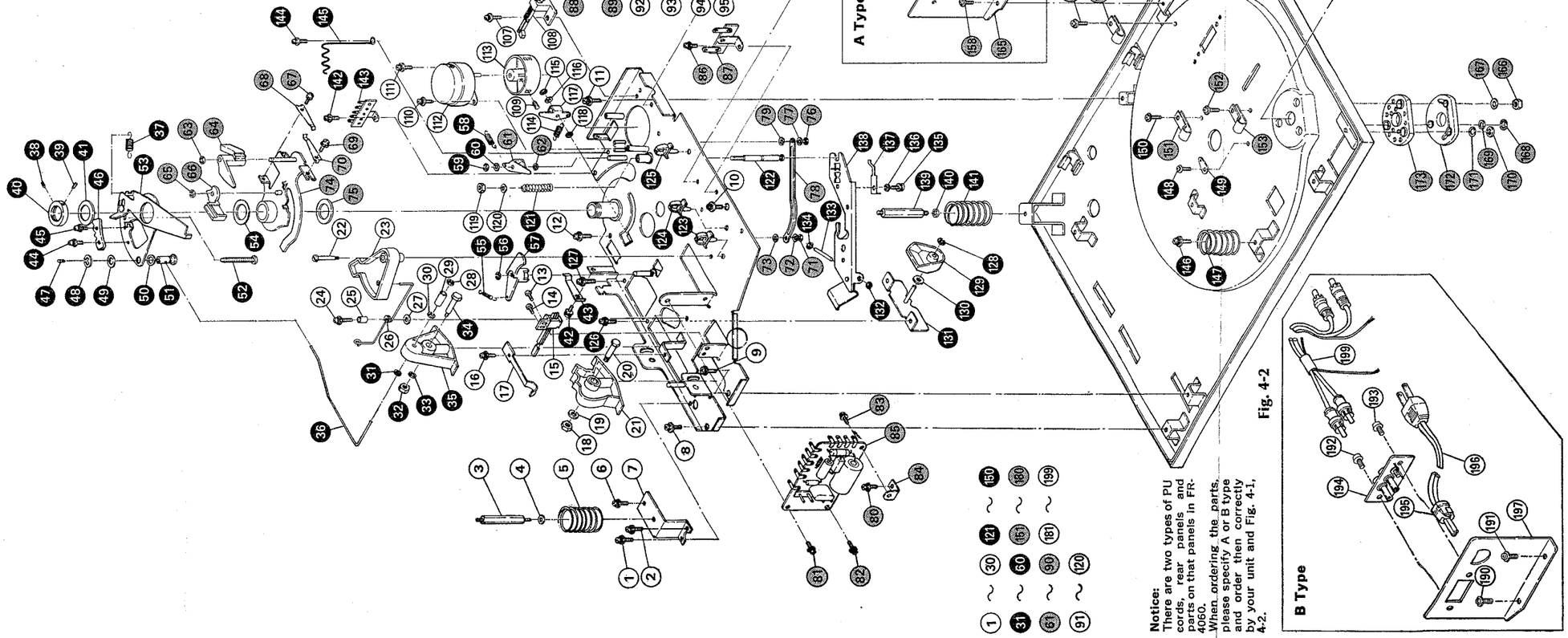


Fig. 4-2

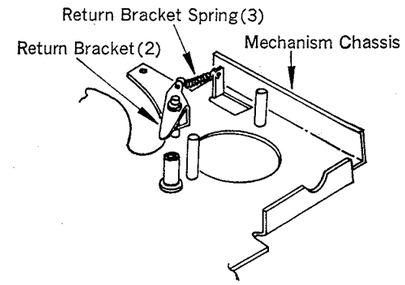
B Type

Notice:
There are two types of PU cords, rear panels and parts on that panels in FR-4060.
When ordering the parts, please specify A or B type and order then correctly by your unit and Fig. 4-1, 4-2.

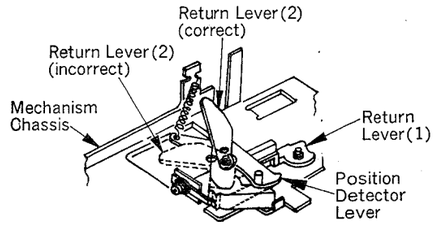
5. TROUBLESHOOTING CHART

Symptom—1	Symptom—2	Cause & What to Do
1. Turntable not rotating	1. Turntable not rotating	1. Belt off
		2. Broken or stretched belt
		3. Loose capstan screw (capstan racing)
		4. Burn out turntable spindle
	2. Motor not rotating	5. Loose connection of power cord
		6. Defective start switch (Leaf switch)
		7. Defective timing motor
2. No sound		8. Cartridge (SV-27) open
		9. Improper connection of output cord
		10. Defective muting switch
		11. Improper operation of amplifier
		12. Imperfect contact of tonearm and shell
3. Distorted or weak sound		13. Improper setting of stylus
		14. Worn out stylus
		15. Dusty stylus
		16. Loose pivot of tonearm
		17. Improper connection of cartridge leads
		18. Poor record cutting
4. Hum		19. Cartridge leads (ground side) open
		20. Improper connection of output cord
		21. Imperfect contact of muting switch
		22. Imperfect contact of tonearm and shell
5. Rumble (Unusual) sound	3. Due to motor	23. Defective motor
		24. Shipping bolts not unscrewed
	4. Other than motor	25. Defective turntable spindle
		26. Dirty capstan
6. Incorrect speed		27. Improper capstan
		28. Improper setting of capstan
		29. Dirty capstan
		30. Stretched belt
7. Improper traciug		31. Defective tonearm
		32. Dirty stylus
		33. Defective stylus
		34. Improper stylus pressure (too light)

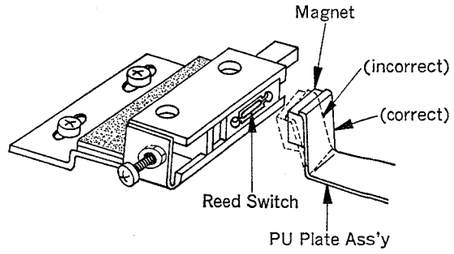
Symptom—1	Symptom—2	Cause & What to Do
8. Trouble of Auto mechanism	5. Auto mechanism not operative	35. Defective start switch (Leaf switch)
		36. Defective micro switch, SW1
		37. Defective micro switch, SW2
		38. Broken crank lever
		39. Defective timing motor
		40. Defective spring of return bracket (2)



	6. Trouble of Auto-In	41. Loose adjustment (Refer to adjustment of auto mechanism)
		42. Defective return lever (2)



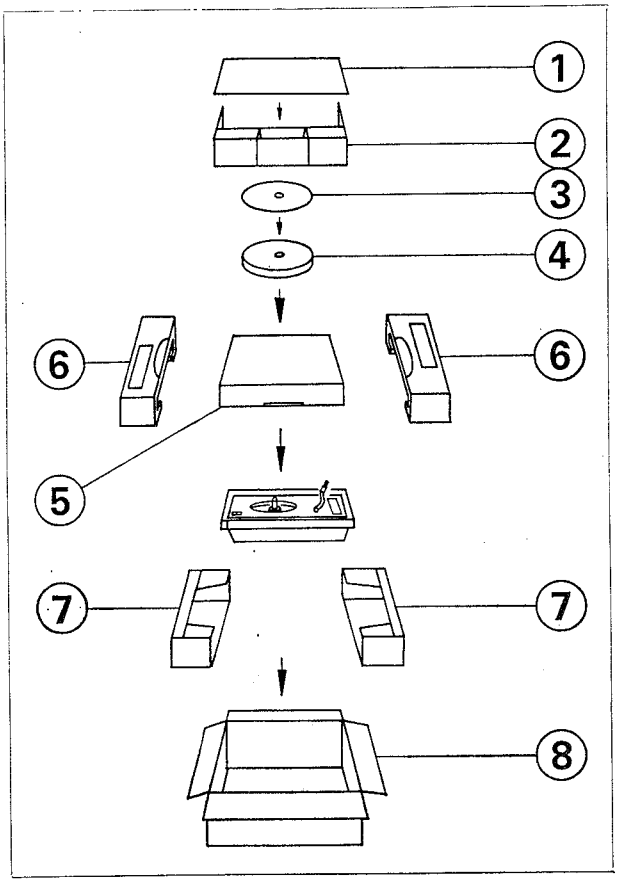
	7. Trouble of Auto-return	43. Loose adjustment (Refer to adjustment of auto mechanism).
		44. Defective reed switch
		45. Declined magnetic field of magnet
		46. Improper setting of magnet



Set magnet horizontally by reed switch.

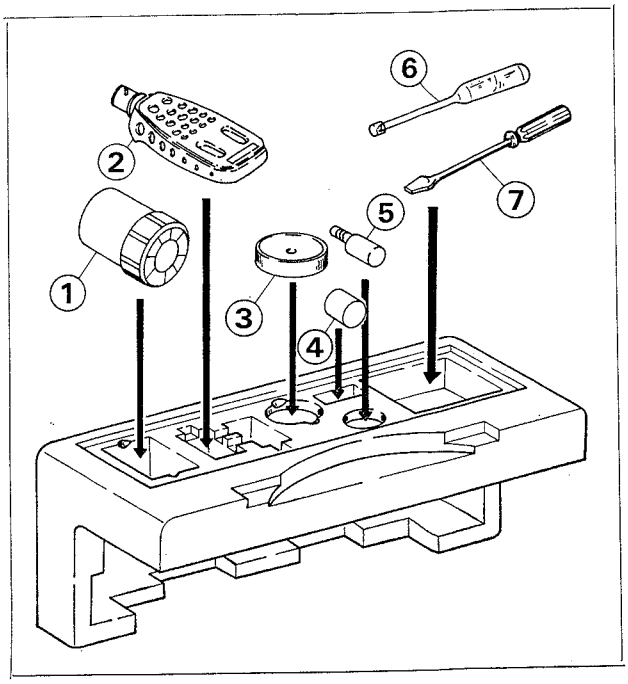
6. PACKING LIST

Parts No.	Stock No.	Description
1	9012131	Inner Packing (upper)
2	9022292	Side Packing
3	5502220	Turntable Rubber Mat
4	6112101	Platter
5	5062103	Dust Cover
6	9022153	Stylofoam Packing
7	9022284	Inner Packing (bottom)
8	9002311	Carton Case



7. ACCESSORY PARTS LIST

Parts No.	Stock No.	Description
1	6912280	Main Weight
2	6642070	Head Shell Ass'y
3	6172040	45 rpm Adaptor
4	6912290	Lateral Weight
5	6912270	Sub Weight
6	9432011	Oil Feeder
7	9422010	Screw Driver
	9202120	Operating Instructions



8. MAINTENANCE

8-1. Replacement of Cartridge (See Fig. 8-1)

1. Turn the locking nut counterclockwise and pull the shell out.
2. Remove the cartridge by loosening the nuts and disconnecting the leads.
3. Attach the cartridge and connect the leads in place correctly.
4. After replacement, adjust the stylus pressure again.

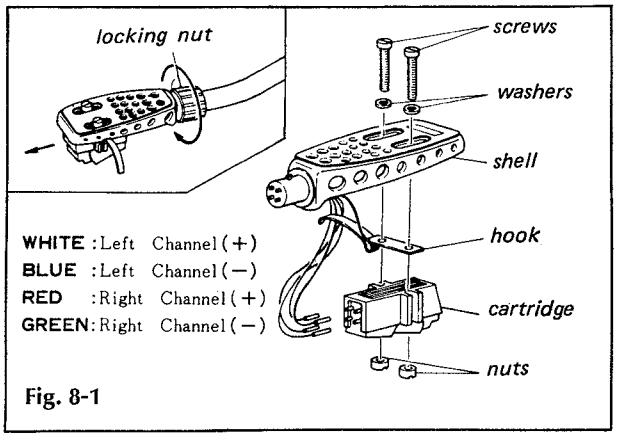


Fig. 8-1

8-2. Replacement of Capstan (See Fig. 8-2)

1. Remove the belt from the capstan and take off platter. Loosen the capstan's setscrew with a small screwdriver and slowly pull the capstan out.
2. Insert the new capstan on the motor shaft and tighten the setscrew firmly. The capstan must be adjusted so that the belt is always in the center of belt guide and the belt still moves easily on the capstan when the Speed Selector buttons are depressed.

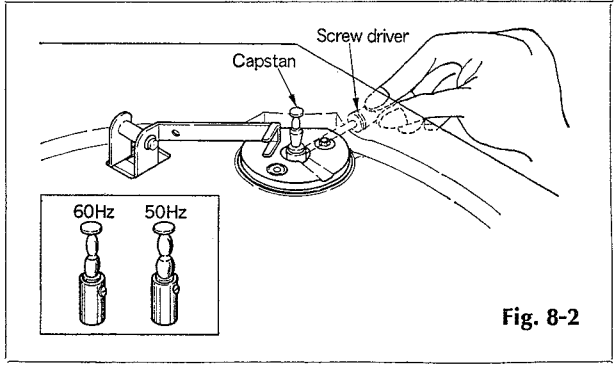


Fig. 8-2

8-3. Lubrication (See Fig. 8-3)

While the need for oiling depends on the length of the time the turntable was operated, it is recommended to lubricate it at least once a year or once every 1,000 hours of use.

Remove the platter and drop a few drops of lubrication oil (supplied) into the oiling orifice shown in Fig. 8-3. Be very careful not to stain the drive belt or capstan with the oil. If you have stained by accident, wipe the oil off completely with benzine.

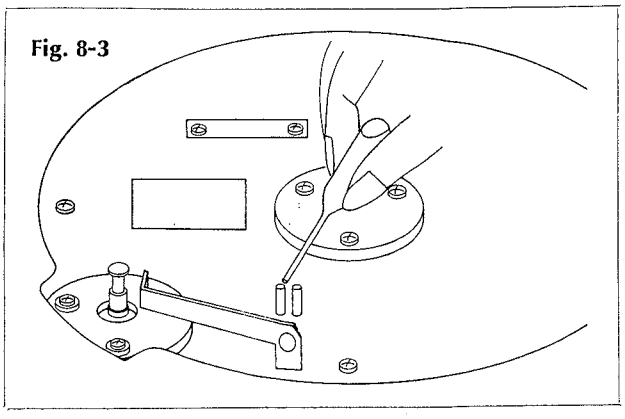


Fig. 8-3

8-4. Changing the Line Voltage (See Fig. 8-4)

The FR-4060 can be used at two different voltages 120V and 240V. Be careful not to set the voltage selector switch improperly to the position of voltage designation as shown in Fig. 8-4.

It should be applicable for the line voltage of electricity using in your area.

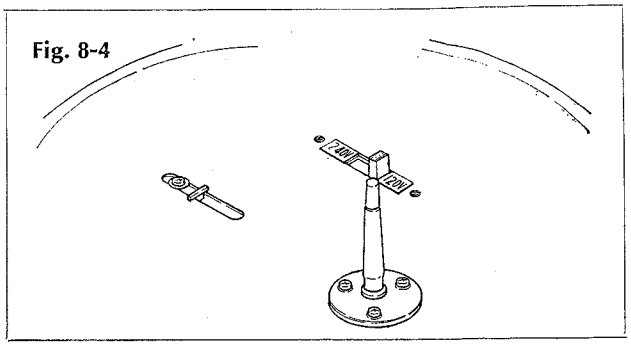


Fig. 8-4